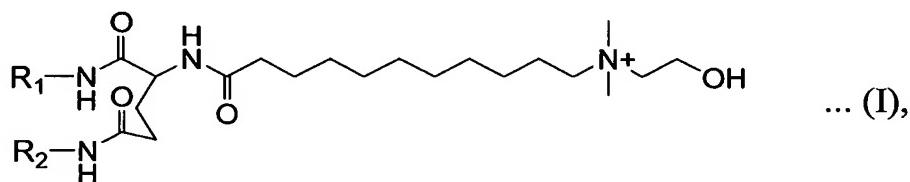


WHAT IS CLAIMED IS:

1. A molecular-oriented polymer gel obtained by self-organizing a self-organizable amphiphilic compound and a monomer interacting with said amphiphilic compound, and then polymerizing said monomer.
- 5 2. The molecular-oriented polymer gel according to claim 1, wherein said amphiphilic compound is a cation comprising a linear or branched alkyl group having 20 or less carbon atoms.
3. The molecular-oriented polymer gel according to claim 2, wherein said cation is represented by the following general formula (I):



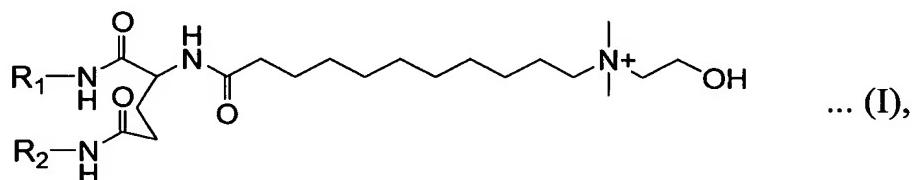
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wherein R_1 and R_2 represent linear or branched alkyl groups having 20 or less carbon atoms, which may be the same or different.

4. The molecular-oriented polymer gel according to any one of claims 1 to 3, wherein said monomer is an anionic monomer.
- 15 5. The molecular-oriented polymer gel according to claim 4, wherein said anionic monomer comprises a sulfonic group.
6. The molecular-oriented polymer gel according to claim 5, wherein said anionic monomer is 2-acrylamide-2-methylpropanesulfonic acid.
7. The molecular-oriented polymer gel according to any one of claims 2
20 to 6, wherein the linear or branched alkyl group of said amphiphilic compound has 10 or less carbon atoms.
8. The molecular-oriented polymer gel according to any one of claims 1 to 3, wherein said monomer is thiophene and/or its derivative, or pyrrole and/or its derivative.
- 25 9. The molecular-oriented polymer gel according to claim 8, wherein said thiophene derivative is at least one selected from the group consisting of

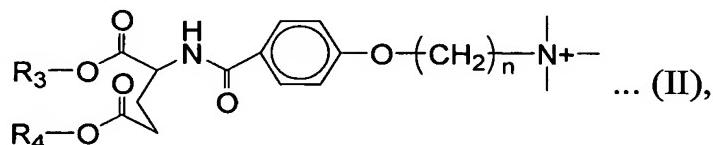
3-thiophencarboxylic acid, 3-thiophenacetic acid, 3-thiophene ethanol, 3,4-ethylenedioxythiophene and bis(thiophene), and wherein said pyrrole derivative is 3-pyrrolecarboxylic acid or 3-pyrroleacetic acid.

10. A molecular-oriented polymer cast film obtained by casting a solution
5 of a self-organizable amphiphilic compound and a monomer interacting with
said amphiphilic compound, and then polymerizing said monomer.
11. A molecular-oriented polymer cast film obtained by casting a solution
of a self-organizable amphiphilic compound on an electrode, and then
supplying current to said electrode in a solution containing a monomer which
10 is thiophene and/or its derivative, or a monomer which is pyrrole and/or its
derivative, to electrochemically polymerize said monomer.
12. The molecular-oriented polymer cast film according to claim 10 or 11,
wherein said amphiphilic compound is a cation comprising a linear or
branched alkyl group having 20 or less carbon atoms.
- 15 13. The molecular-oriented polymer cast film according to claim 12,
wherein said cation is represented by the following general formula (I):



wherein R_1 and R_2 represent linear or branched alkyl groups having 20 or less carbon atoms, which may be the same or different.

- 20 14. The molecular-oriented polymer cast film according to claim 12,
wherein said cation is represented by the following general formula (II):



wherein R_3 and R_4 represent linear or branched alkyl groups having 20 or less carbon atoms, which may be the same or different, and n is an integer of 2 to

12.

15. The molecular-oriented polymer cast film according to any one of claims 10, 12 to 14, wherein said monomer is thiophene and/or its derivative, pyrrole and/or its derivative, or another anionic monomer than said thiophene derivative and said pyrrole derivative.

5 16. The molecular-oriented polymer cast film according to claim 15, wherein said anionic monomer other than said thiophene derivative is 2-acrylamide-2-methylpropanesulfonic acid.

10 17. The molecular-oriented polymer cast film according to claim 15, wherein said thiophene derivative is at least one selected from the group consisting of 3-thiophencarboxylic acid, 3-thiophenacetic acid, 3-thiophene ethanol, 3,4-ethylenedioxothiophene and bis(thiophene), and wherein said pyrrole derivative is 3-pyrrolecarboxylic acid or 3-pyrroleacetic acid.

15 18. A method for producing the molecular-oriented polymer gel recited in any one of claims 1 to 9, comprising the steps of mixing said amphiphilic compound and said monomer to self-organize them, and then polymerizing said monomer.

20 19. The method for producing a molecular-oriented polymer gel according to claim 18, wherein the polymerization reaction of said monomer is carried out at a temperature lower than a phase transition temperature of a self-organized-to-molecular-level body of said amphiphilic compound and said monomer.

25 20. A method for producing the molecular-oriented polymer cast film recited in any one of claims 10 to 17, comprising the steps of preparing a solution of said amphiphilic compound and said monomer, casting said solution, and then polymerizing said monomer.

21. A method for producing the molecular-oriented polymer cast film recited in any one of claims 10 to 17, comprising the steps of preparing a

solution of said amphiphilic compound, casting said solution on an electrode, dried said solution to form a film of said amphiphilic compound, immersing said film in a solution comprising said monomer, and supplying current to said electrode to electrochemically polymerize said monomer.

- 5 22. The method for producing a molecular-oriented polymer cast film according to claim 20 or 21, wherein the polymerization reaction of said monomer is carried out at a temperature lower than a phase transition temperature of a self-organized-to-molecular-level body of said amphiphilic compound and said monomer.

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